Additive Manufacturing with Metal Powders 2016: An Opportunity Analysis and Ten-Year Forecast

Description: While a number of firms in 3D printing faltered in 2015, participants in the metal additive manufacturing segment continued on their path of explosive growth.

With interest and acceptance from critical industries at an all time high, the conversation for widespread metal additive manufacturing is beginning to shift from "when?" to "where?" - a question that reflects an evolution away from just tactical manufacturing of low volume components and prototypes, and into addressing serial production opportunities and integration into established manufacturing environments.

With these developments in mind, the author is following up to our best-selling 2014 study of metal powder opportunities in additive manufacturing, with the most comprehensive market study of metal additive manufacturing ever created, including analysis of:

- Opportunities for metal powder suppliers
- The evolution of metal powder supply chains to meet the needs of evolving additive manufacturing markets
- Existing and emerging metal additive manufacturing technologies
- Metal-oriented 3D printing services
- End user industries and applications that are adopting metal printing.

In this report, the author presents a complete analysis of the powder manufacturing supply chain. No other source provides such a wealth of analysis and market data on metal additive manufacturing.

The industry-standard ten-year forecasts are applied in this report across the entire metal additive manufacturing sector - from print technology and install bases, to powder demand by adopting industry, to revenues associated with metal additive manufacturing materials.

Contents:

Chapter One: Metal Additive Manufacturing Market in 2016
1.1 Summary of Metal Additive Manufacturing Market Activity in 2015
1.1.1 Metal Additive Manufacturing Market Moves Towards Strategic Manufacturing Adoption in 2015
1.1.2 Regional Perspectives on Metal Additive Manufacturing Growth
1.1.3 Metal AM System Orders Show Growth Again After Record 2014 Sales
1.1.4 Further Establishment of Emerging Commercial Metal Additive Manufacturing Industries
1.2 Identifying Major Market Trends in Metal Additive Manufacturing and Materials
1.2.1 Quality Assurance and Process Control Development Initiatives Now Receiving Full Focus
1.2.2 Serial Manufacturing Application Development Resulting in Transformation of Metal Powder Supply Chain
1.2.3 Technology and Software Integration Initiatives Laying the Groundwork for Advanced Manufacturing
1.3 Characterizing Metal Additive Manufacturing Markets by Technology and Materials
1.3.1 Powder Bed Fusion Equipment Market Highly Diversified
1.3.2 Opportunities for Powder Directed Energy Deposition Equipment Tied to Markets for Large Structural Components
1.3.3 Markets for Binder Jetting Technology Limited Today, Could See Significant Future Expansion
1.4 Summary of Market Opportunities and Future Outlook for Metal Additive Manufacturing

Chapter Two: Metal Additive Manufacturing Technology and End Users
2.1 Metal Powder Bed Fusion Technologies
2.1.1 Laser-Based Powder Bed Fusion
2.1.2 Electron Beam Powder Bed Fusion
2.1.3 Key Development Trends for Powder Bed Fusion Equipment
2.2 Directed Energy Deposition Technologies
2.3 Metal Binder Jetting Technologies
2.4 Other and Emerging Metal AM Technologies
2.5 Analysis of Key AM System Vendors
2.5.1 3D Systems
2.5.2 EOS
2.5.3 Arcam
2.5.4 SLM Solutions
2.5.5 Concept Laser
2.5.6 Renishaw
2.5.7 Optomec
2.5.8 ExOne
2.5.9 Trumpf/Sisma

2.6 Key Points from This Chapter

Chapter Three: The Metal Powder Supply Chain – Production, Supply, and Market Influencers
3.1 Characterization of Metal Powders for Additive Manufacturing
3.2 Overview of Metal Powder Supply Chain
3.2.1 Comparisons and Analysis of Additive Manufacturing in the Context of the Powder Metallurgy Industry
3.2.2 Establishing the Additive Manufacturing-Specific Supply Chain
3.3 Metal Powder Production Methods and Trends
3.3.1 Gas-Based Atomization Methods
3.3.2 Plasma-Based Atomization Methods
3.3.3 Emerging AM Powder Production Methods
3.3.4 Connecting Powder Production Technology, End-User Requirements, and Costs of Materials in Metal AM
3.4 Analysis of Major and Emerging Metal Powder Suppliers
3.4.1 Specialty Providers and Resellers
3.4.2 Global Powder and Metal Products Companies
3.5 Key Points from This Chapter

Chapter Four: Metal Alloy Categories and Applications in Additive Manufacturing
4.1 Steels
4.1.1 Applications for Steels in Additive Manufacturing
4.1.2 Production Techniques for Steel Powders Used in Additive Manufacturing
4.1.3 Top Markets for Steel Powder Additive Manufacturing
4.2 Cobalt Chrome
4.2.1 Applications for Cobalt Chrome in Additive Manufacturing
4.2.2 Top Markets for Cobalt Chrome in Additive Manufacturing
4.3 Titanium Alloys
4.3.1 Applications for Titanium Alloys in Additive Manufacturing
4.3.2 Production and Supply Chain Considerations for Titanium in Additive Manufacturing
4.3.3 Top Markets for Titanium Alloys in Additive Manufacturing
4.4 Nickel Alloys
4.4.1 Applications for Nickel Alloys in Additive Manufacturing
4.4.2 Top Markets for Nickel Alloys in Additive Manufacturing
4.5 Aluminum
4.5.1 Top Markets for Aluminum in Additive Manufacturing
4.6 Precious Metals
4.6.1 Top Markets for Precious Metals in Additive Manufacturing
4.7 Other Alloys

Chapter Five: Ten-Year Market Forecasts
5.1 Methodology and Key Forecast Considerations
5.2 Key Metal Additive Manufacturing Market Metrics
5.3 Metal Additive Manufacturing Hardware Forecasts
5.4 Metal Material Demand by Industry Segment
5.4.1 Metal AM Forecasts in the Aerospace Industry
5.4.2 Metal AM Forecasts in the Automotive Industry
5.4.3 Metal AM Forecasts in the Dental Industry
5.4.4 Metal AM Forecasts in the Jewelry Industry
5.4.5 Metal AM Forecasts in the Medical Industry
5.4.6 Metal AM Forecasts in the Service Bureau Industry
5.4.7 Metal AM Forecasts in Other Emerging Industries
5.4.8 Summary of Metal Forecast Revenues
List of Exhibits
Exhibit 1-1: Updated Expectations and Outcomes on Key Metal AM Influencing Factors
Exhibit 1-2: Theoretical Metal Additive Manufacturing Adoption Model
Exhibit 1-3: Estimated 2015 Metal Additive Manufacturing Unit Sales Growth
Exhibit 1-4: Annual Metal Powder Demand from Emerging Industries, 2015-2025
Exhibit 1-5: Summary of Top Powder Bed Fusion Markets and Materials
Exhibit 1-6: Summary of Top Powder Based Directed Energy Deposition Markets and Materials
Exhibit 1-7: Total Projected Metal Powder Revenue, All Technologies, Materials, and Markets, 2015-2025
Exhibit 1-8: Current Metal Additive Manufacturing Technology Hierarchy
Exhibit 1-9: Laser Metal Powder Bed Fusion System Parameters
Exhibit 1-10: Electron-Based Powder Bed Fusion System Parameters
Exhibit 1-11: Powder-Based Directed Energy Deposition System Parameters
Exhibit 1-12: Basic Powder Metallurgy Fabrication Process
Exhibit 1-13: Expanded Total PM Fabrication Process Chain
Exhibit 1-14: Comparing Powder Supply from the End-User Perspective
Exhibit 1-15: AM Metal Powder Production Process Flow
Exhibit 1-16: Comparison of Powder Production Techniques for Use in Additive Manufacturing
Exhibit 1-17: Illustrating the AM Metal Powder Supply Chain
Exhibit 1-18: Market Opportunity Visualization of AM Metal Alloys and Alloy Families
Exhibit 1-19: Available Steel Powders for Additive Manufacturing
Exhibit 1-20: Top Markets for Steel Additive Manufacturing
Exhibit 1-21: Currently Available Specialty Titanium Alloys for AM
Exhibit 1-22: Top Markets for Titanium Alloys Additive Manufacturing
Exhibit 1-23: Top Markets for Nickel Alloys Additive Manufacturing
Exhibit 1-24: Top Markets for Aluminum Alloys Additive Manufacturing
Exhibit 1-25: Top Markets for Precious Metal Alloys Additive Manufacturing
Exhibit 1-26: Total Global AM Metal Powder Demand (U.S. Tons), by Alloy Group, 2015-2025
Exhibit 1-27: Total Global AM Metal Powder Revenue, by Alloy Group, 2015-2025
Exhibit 1-28: Regional AM Metal Powder Revenue, All Alloys, 2015-2025
Exhibit 1-29: Global Annual Powder-Based Metal AM Unit Sales, by Technology Sub-segment, 2015-2025
Exhibit 1-30: Global Annual Powder-Based Metal AM Install Base, by Technology Sub-segment, 2015-2025
Exhibit 1-31: Regional Powder-Based Metal AM Install Base, All Technologies, 2015-2025
Exhibit 1-32: Projected Metal AM System Die Out Rate (%), by Vertical Segment, 2015-2025
Exhibit 1-33: Total Projected Metal Powder Demand in Aerospace, by Alloy Type, 2015-2025
Exhibit 1-34: Total Projected Metal Powder Revenue in Aerospace, by Alloy Type, 2015-2025
Exhibit 1-35: Total Projected Metal Powder Demand in Automotive, by Alloy Type, 2015-2025
Exhibit 1-36: Total Projected Metal Powder Revenue in Automotive, by Alloy Type, 2015-2025
Exhibit 1-37: Total Projected Metal Powder Demand in Dental, by Alloy Type, 2015-2025
Exhibit 1-38: Total Projected Metal Powder Revenue in Dental, by Alloy Type, 2015-2025
Exhibit 1-39: Total Projected Metal Powder Demand in Jewelry, by Alloy Type, 2015-2025
Exhibit 1-40: Total Projected Metal Powder Revenue in Jewelry, by Alloy Type, 2015-2025
Exhibit 1-41: Total Projected Metal Powder Demand in Medical, by Alloy Type, 2015-2025
Exhibit 1-42: Total Projected Metal Powder Revenue in Medical, by Alloy Type, 2015-2025
Exhibit 1-43: Total Projected Metal Powder Demand in Service Bureaus, by Alloy Type, 2015-2025
Exhibit 1-44: Total Projected Metal Powder Revenue in Service Bureaus, by Alloy Type, 2015-2025
Exhibit 1-45: Total Projected Metal Powder Demand in Other Industries, by Alloy Type, 2015-2025
Exhibit 1-46: Total Projected Metal Powder Revenue in Other Industries, by Alloy Type, 2015-2025
Exhibit 1-47: Total Metal Powder Revenues, by Market, 2015 to 2025

Ordering:
Order Online - http://www.researchandmarkets.com/reports/3619110/
Order by Fax - using the form below
Order by Post - print the order form below and send to
Research and Markets,
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct and select the format(s) you require.

Product Name: Additive Manufacturing with Metal Powders 2016: An Opportunity Analysis and Ten-Year Forecast
Web Address: http://www.researchandmarkets.com/reports/3619110/
Office Code: SCBRX6FX

Product Formats
Please select the product formats and quantity you require:

<table>
<thead>
<tr>
<th>Quantity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic (PDF) - Single User:</td>
<td>USD 4495</td>
</tr>
<tr>
<td>Electronic (PDF) - 1 - 5 Users:</td>
<td>USD 5495</td>
</tr>
<tr>
<td>Electronic (PDF) - Enterprisewide:</td>
<td>USD 6495</td>
</tr>
</tbody>
</table>

Contact Information
Please enter all the information below in BLOCK CAPITALS

<table>
<thead>
<tr>
<th>Title:</th>
<th>Mr</th>
<th>Mrs</th>
<th>Dr</th>
<th>Miss</th>
<th>Ms</th>
<th>Prof</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last Name:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email Address: *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job Title:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postal / Zip Code:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Country:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone Number:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:

Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:

- Account number: 833 130 83
- Sort code: 98-53-30
- Swift code: ULSBIE2D
- IBAN number: IE78ULSB98533083313083
- Bank Address: Ulster Bank, 27-35 Main Street, Blackrock, Co. Dublin, Ireland.

If you have a Marketing Code please enter it below:

Marketing Code:

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp

Please fax this form to:

(646) 607-1907 or (646) 964-6609 - From USA
+353-1-481-1716 or +353-1-653-1571 - From Rest of World